

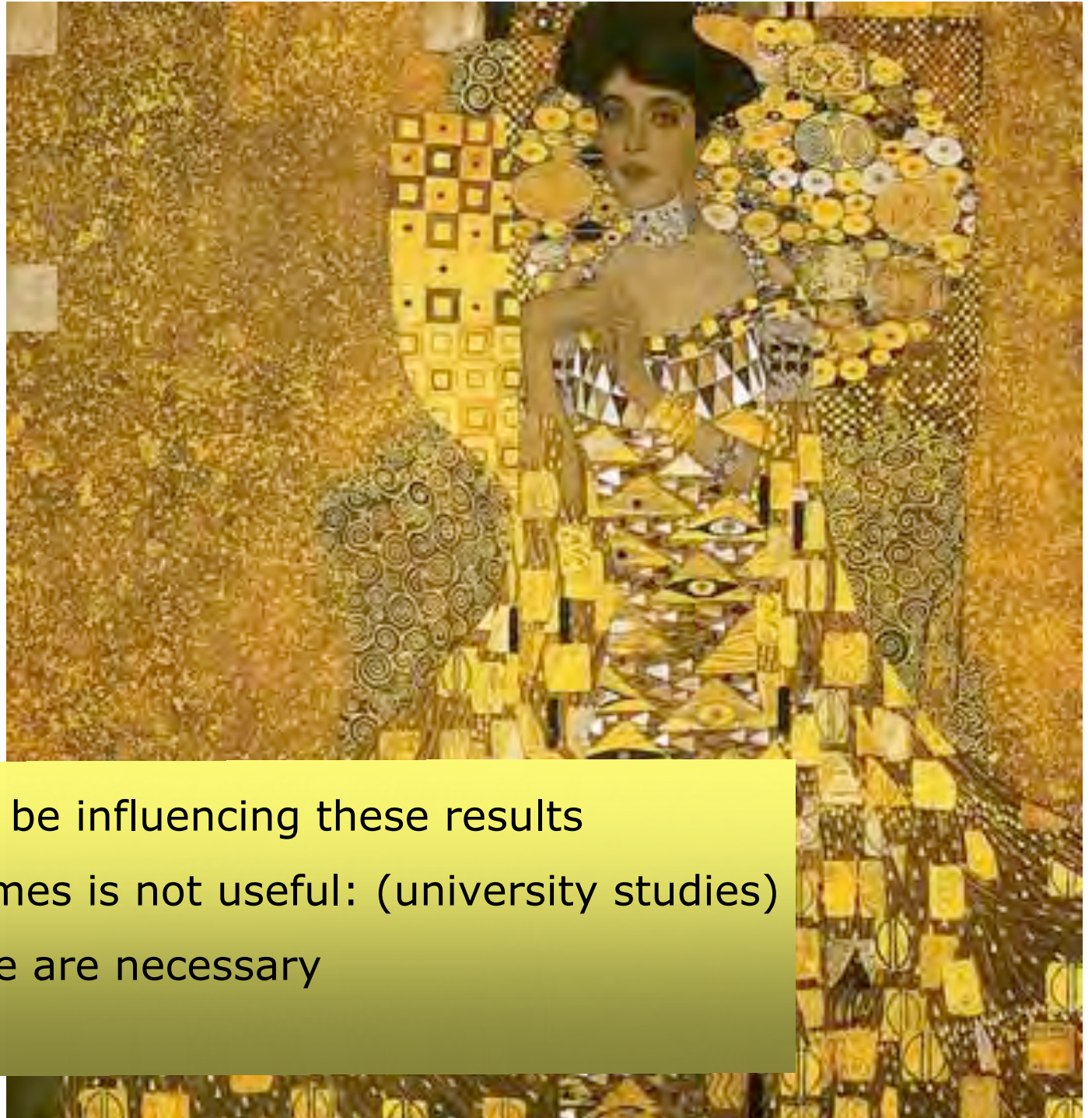


**Pasta's contributions
to reducing obesity.**

Marta Garaulet Aza
Professor of Physiology
University of Murcia
Spain.

Obesity

- **Multifactorial** disease
- Multifactorial treatment
- **Dietary, pharmacological and surgery**
- Despite the many benefits associated with weight loss, the **success of dietetic treatment** is still being questioned
- Indeed, in the long run, professional and commercial programs are often considered **ineffective**



- ❖ Many factors can be influencing these results
- ❖ Research sometimes is not useful: (university studies)
- ❖ Studies in real life are necessary



1960s

- **Type of diet:**
- High in Proteins
- High in carbohydrates
- High in fat
- Etc.



Nutritional and health

Weight loss

No differences

-5,1 Kg

12 weeks

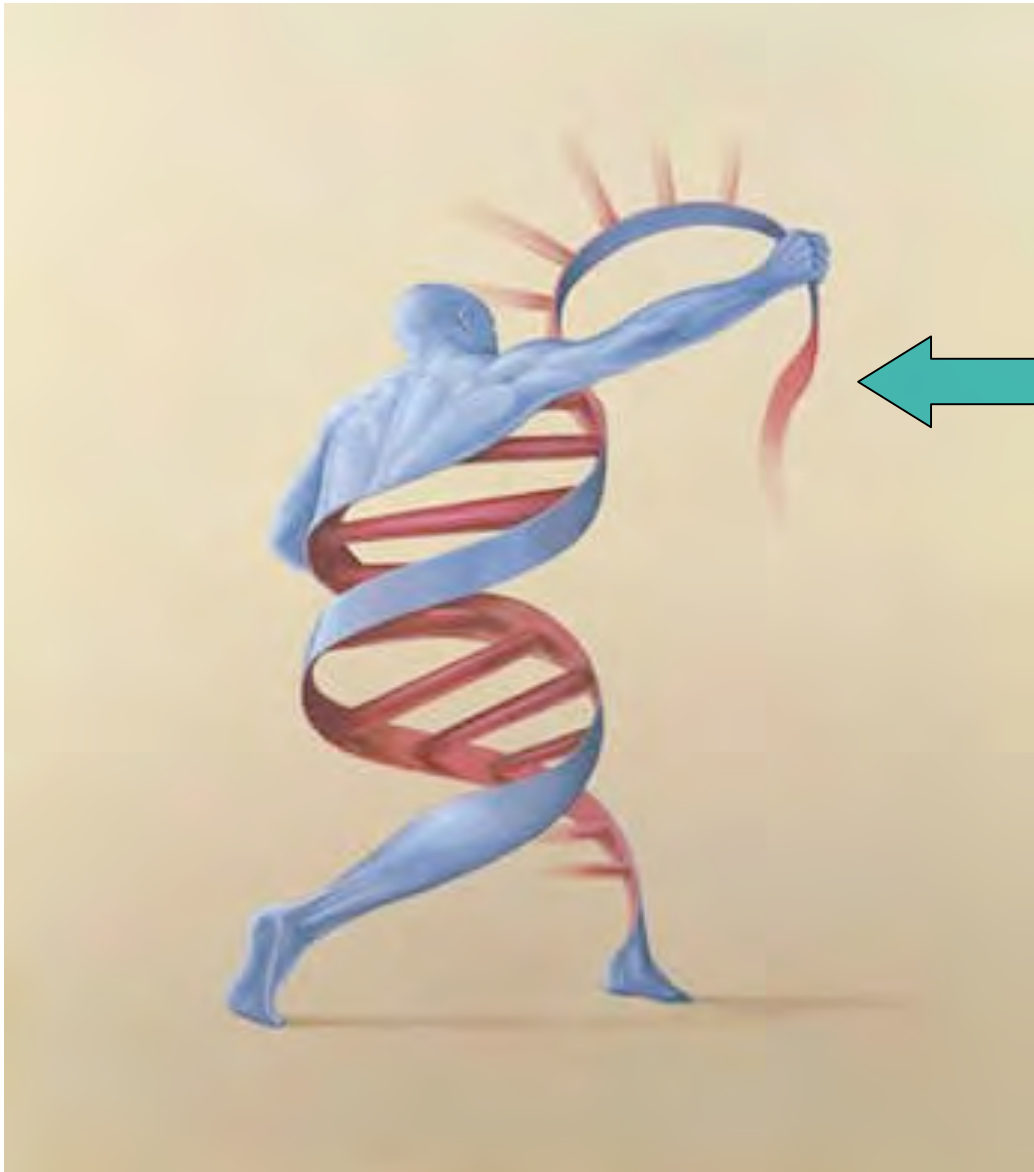
Landers *et al.*, 2002,
J Okla State Med Assoc

Ann Intern Med. 2010

Inter-individual variability



Nutrigenetics



stress



Alcohol



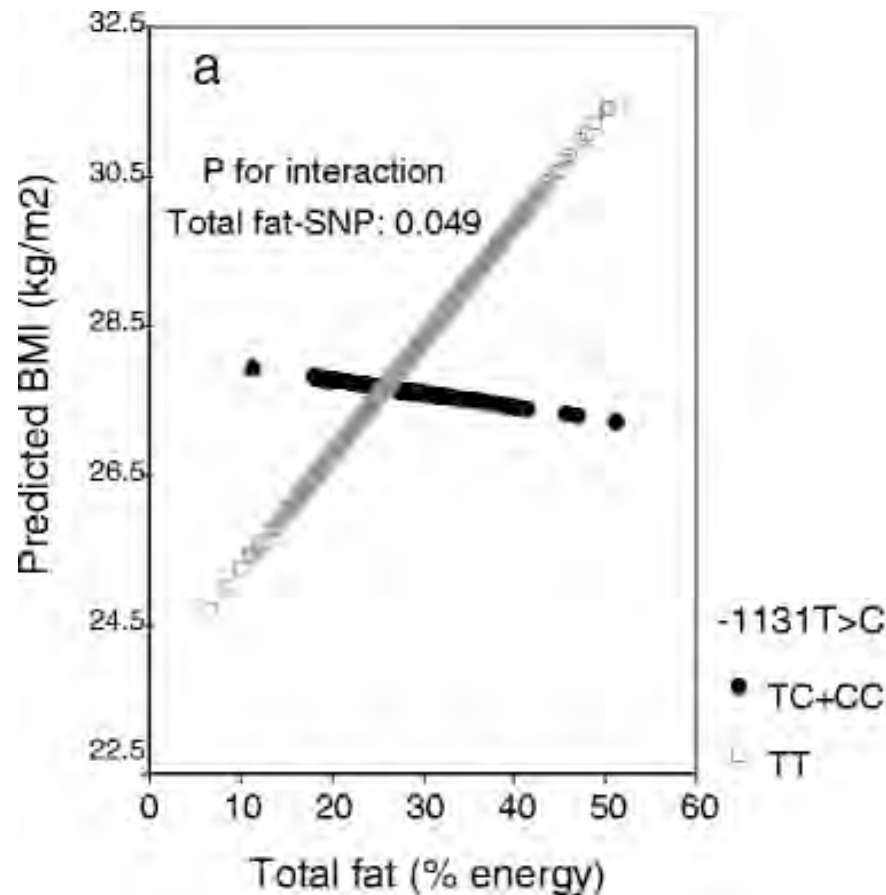
Diet



Physical activity

ApoA5

Obesity and fat

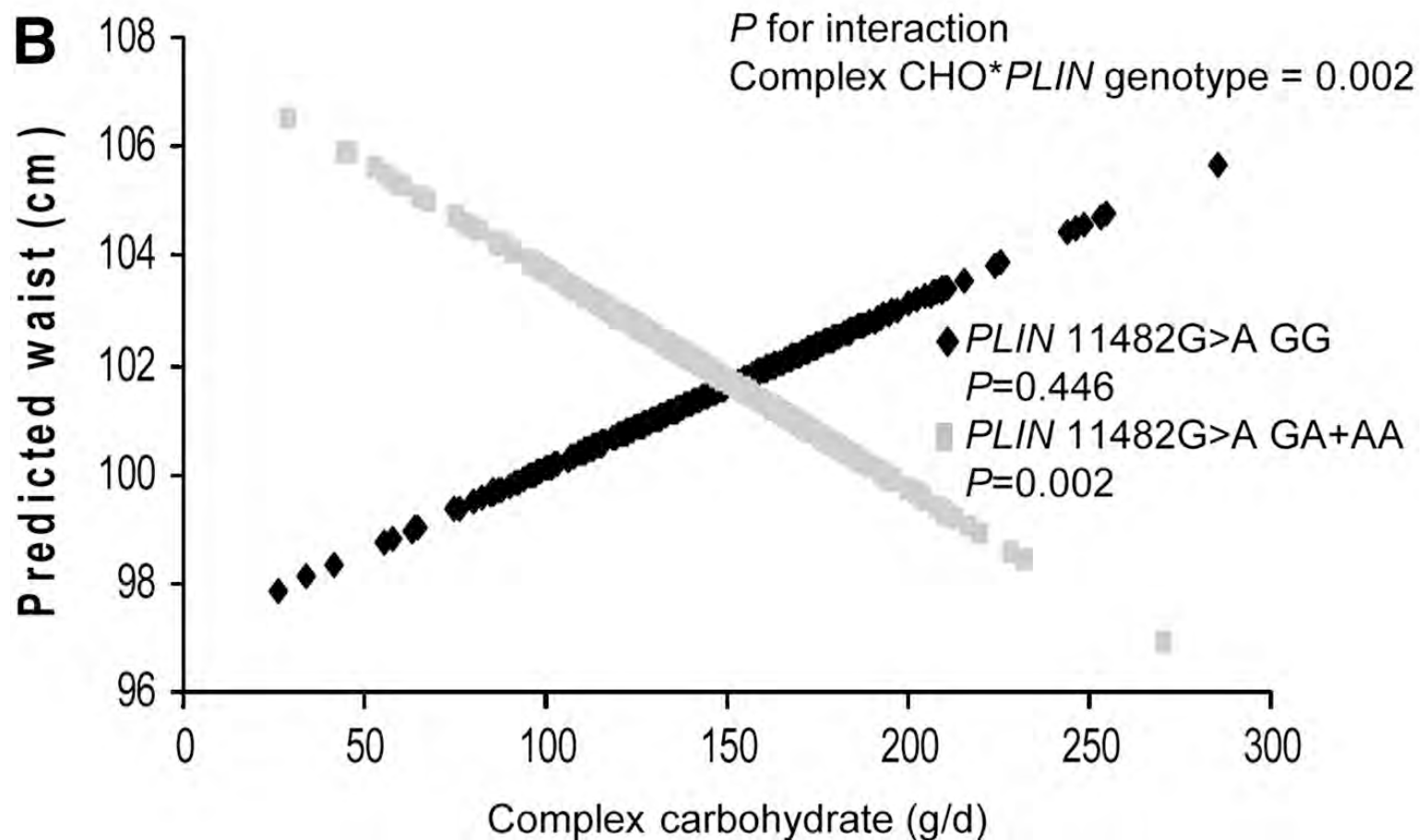


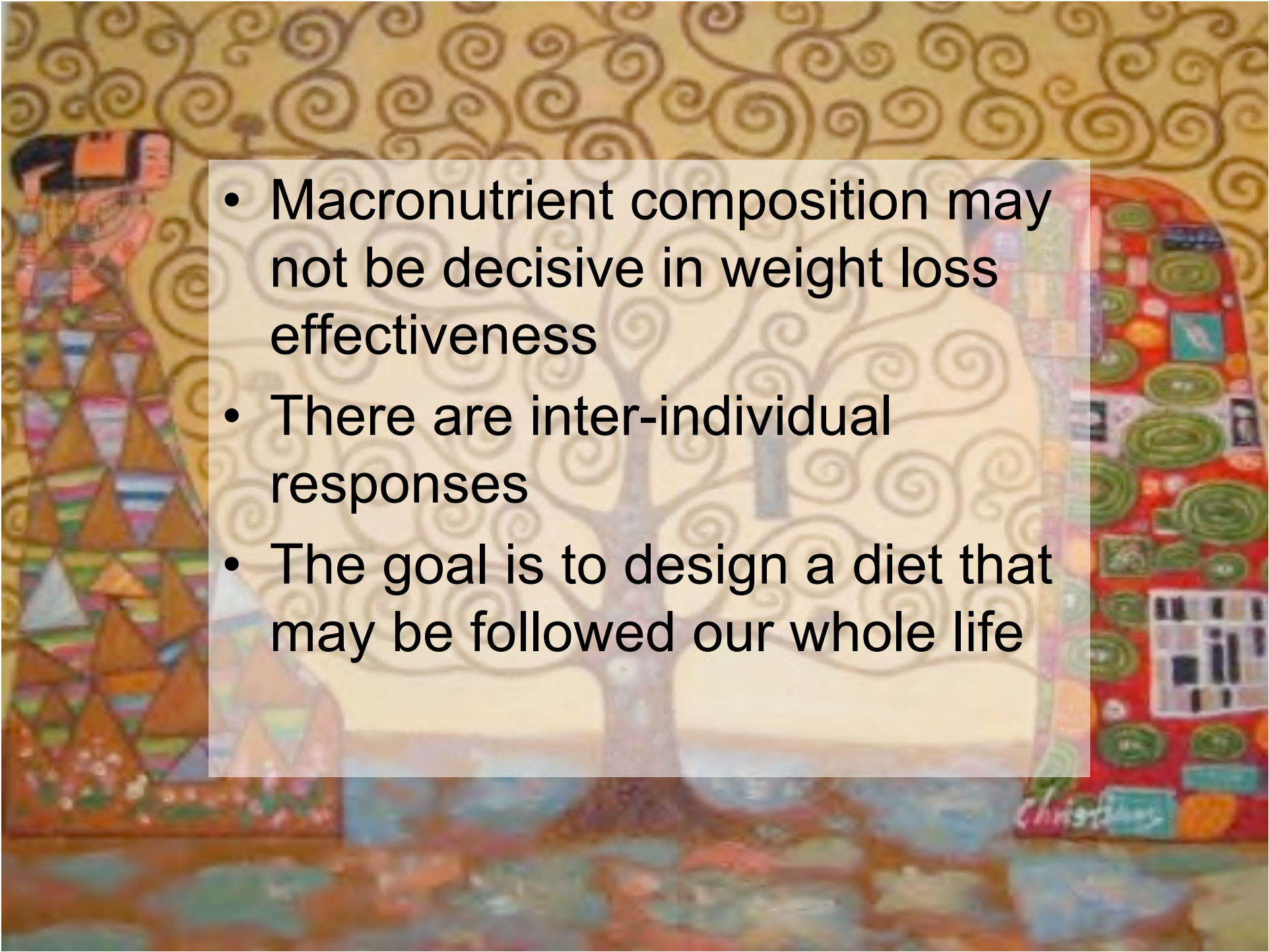
D Corella et al., *Journal of Molecular Medicine*, 2007

Major allele carriers TT increase obesity with fat intake. Surprisingly in minor allele carriers this relationship is not present.

Perilipin Obesity and carbohydrates

Smith C, et al., J.Nutr.2008

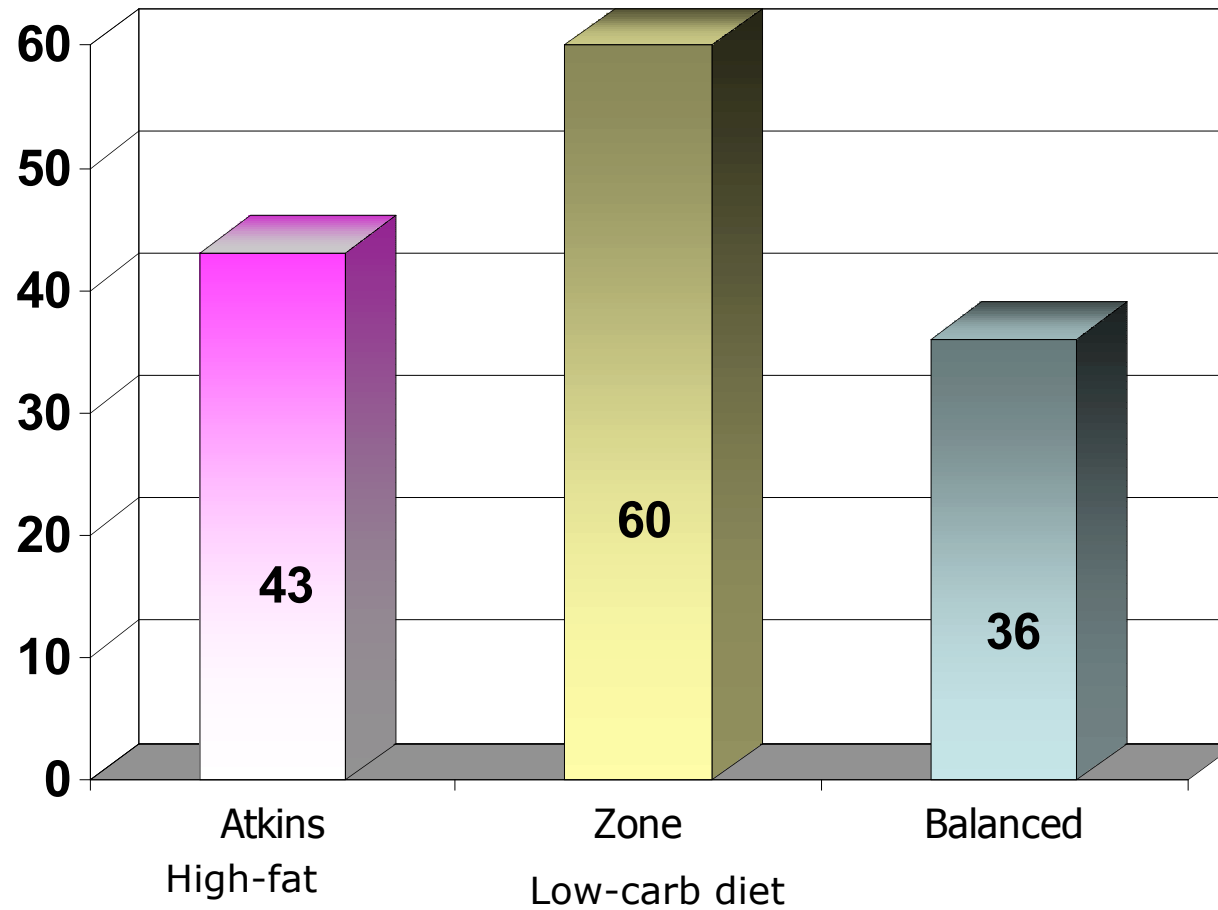


- 
- Macronutrient composition may not be decisive in weight loss effectiveness
 - There are inter-individual responses
 - The goal is to design a diet that may be followed our whole life

The best diet of the world is not useful
if the patient doesn't follow it

(80% PATIENTS ABANDON)

Attrition (%)



Landers *et al.*, 2002, *J Okla State Med Assoc*

Specific hunger for carbohydrates



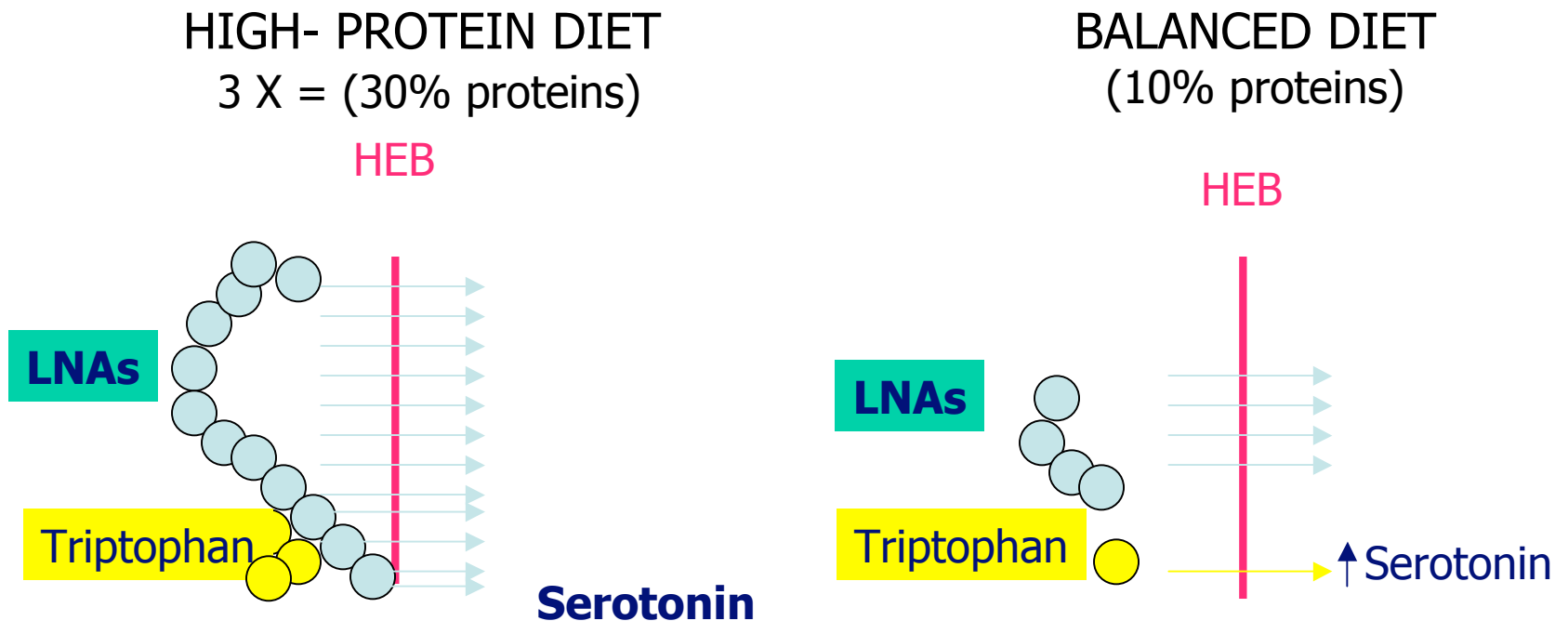
This is one of the reasons why after dieting some of us start to crave for sweets specially for chocolate to finish with this specific hunger.

serotonin and depression



Serotonin and depression

Central nervous system low levels of serotonin have been associated with depression, addiction and obsessive-compulsive disorder, and ingestion of carbohydrates, especially chocolate.



LNAs: Large Neutral Aminoacids; HEB: Hematoencephalic Barrier_

Science. 1971. 174(13):1023-5.

Brain serotonin content: increase following ingestion of carbohydrate diet.

John D. Fernstrom and Richard J. Wurtman

Laboratory of Neuroendocrine Regulation,
Department of Nutrition and Food
Science, Massachusetts Institute of
Technology, Cambridge

In the rat, the injection of insulin or the consumption of **carbohydrate causes sequential increases in the concentrations of tryptophan in the plasma and the brain and of serotonin in the brain.**

Serotonin-containing neurons may thus participate in systems whereby the rat brain integrates information about the metabolic state in its relation to control of homeostasis and behavior.

Science 27 1972:178 (4059): 414 - 6

Brain Serotonin Content: Physiological Regulation by Plasma Neutral Amino Acids

John D. Fernstrom and Richard J. Wurtman

Laboratory of Neuroendocrine Regulation,
Department of Nutrition and Food Science,
Massachusetts Institute of Technology,
Cambridge

When plasma tryptophan is elevated by the injection of tryptophan or insulin, or by the consumption of carbohydrates, brain tryptophan and serotonin also rise;

However, when even larger elevations of plasma tryptophan are produced by the ingestion of protein-containing diets, brain tryptophan and serotonin do not change. **The main determinant of brain tryptophan and serotonin concentrations does not appear to be plasma tryptophan alone, but the ratio of this amino acid to other plasma neutral amino acids**



- Women, especially, are vulnerable to how carbohydrates affect their moods.

- **Women normally have one third less serotonin than men.** Diets that severely restrict carbohydrates will result in even lower serotonin levels.

- Women on high protein/very low carbohydrate diets are at greater risk for depression, seasonal affective disorder (SAD), carbohydrate crave/binge disorder and severe premenstrual syndrome.

The goal is to lose weight in ways that enhance health rather than in ways that may harm.

High-Fat diets: 4% Carbohydrates; 12-33% proteins; 63-94% fats

A wide body of scientific evidence links the consumption of animal protein, saturated fat, and cholesterol with CVD, cancer, and other chronic illnesses

70% of patients on an Atkins diet for 6 months were constipated, 65% had halitosis, 54% reported headaches, and 10% had hair loss

High-protein diets may cause loss of calcium and decreased levels of urinary citrate, leading to osteoporosis and kidney stones

Ketone bodies formed on a high-protein diet undergo urinary excretion to maintain electrical neutrality, resulting in the loss of cations such as calcium, magnesium, and potassium

An Atkins diet may increase postprandial lipemia and increase free fatty acids, which may have harmful effects on platelet aggregation and may promote ventricular arrhythmias

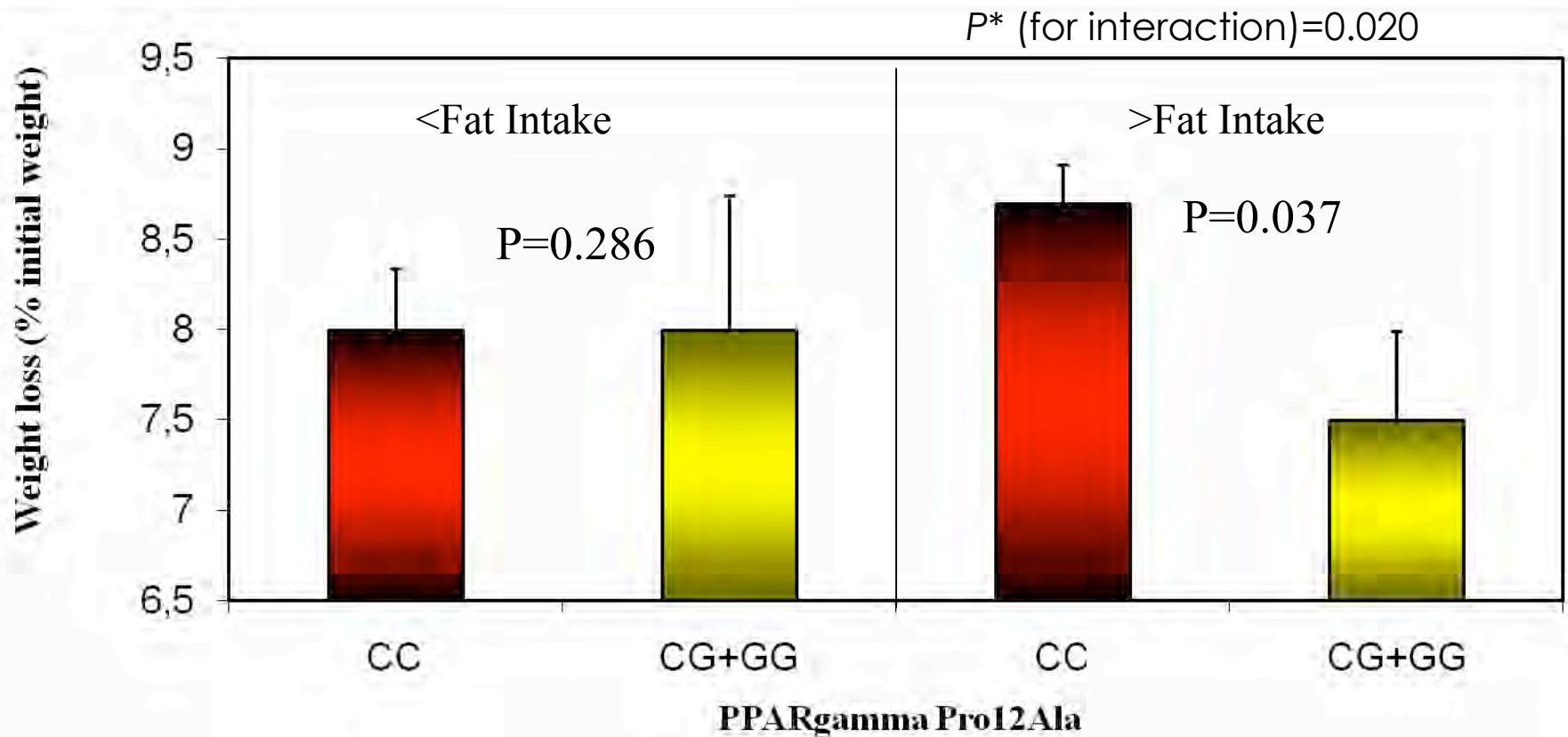
Adverse vascular effects not reflected in serum markers

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Fat intake and genes

PPARgamma and Weight loss



Moreover, the deleterious effects of some genes are only present when the subjects have a high fat diet.

MEDITERRANEAN DIET: a good alternative



To avoid all these problems

- New evidence points towards a possible role of the Mediterranean diet in **preventing** overweight/obesity
- Different Mediterranean-style diets have been shown as a safe strategy for the **treatment** of obesity
- A greater adherence to the Mediterranean diet has been associated with **a lower prevalence of abdominal** obesity
- Recently it has been proposed that the Mediterranean Diet is particularly effective on **glycemic control**

Cereals

Abundance of vegetables and fruit

Olive oil as the principal fat

Dairy products (cheese) in low to moderate amounts

Foods from animals in limited amounts (high consumption of fish)

Wine in moderation and with meals

50-55% Of the total calories of the diet come from carbohydrate



The mediterranean diet as a complex carbohydrate-rich diet



Glycemic Index

Pasta	
Cheese tortellini	50
Fettucini	32
Linguini	50
Macaroni	46
Spagh, 5 min boiled	33
Spagh, 15 min boiled	44
Spagh, prot enrich	28
Vermicelli	35

Low glycemic index < 55



- Low glycemic index load
- Beneficial even for diabetics
- Half of the energy than fats
- They stimulate their own thermogenesis
- An important filling effect (increase satiety)
- Glucose is the main nutrient for cells
- Specific hunger for carbohydrates

Legumes, the poor man's meat

- Lentils, chickpeas, white beans
- Protein rich (*rhizobium*).
- **Pulses + rice = Protein complementation**
- High fiber content (3 x higher than fruits)
- High calcium content
- Important volume and high satiety power
- 7%-8% reduction in mortality ratio for every 20g increase in daily legume intake
(Blackberry et al., 2004)
- Low GI: lentils: 28, Soybeans: 18



Legumes, fiber content



- 1 banana: 2 g
- 1 kiwi: **9** g
- 1 slice of brown bread: 4 g
- 1 Orange: 3 g
- Lentils, beans and **chickpeas: 15** g
- 1 salad, of lettuce, tomato and onion: 8g



Effects of a Plant-Based High-Carbohydrate/High-Fiber Diet Versus High-Monounsaturated Fat/Low-Carbohydrate Diet on Postprandial Lipids in Type 2 Diabetic Patients

Claudia De Natale, MD, PHD, Giovanni Annuzzi, MD, Lutgarda Bozzetto, MD, Raffaella Mazzeo, MD, Giuseppina Costabile, PHD, Ornella Ciano, RD, Gabriele Riccardi, MD and Angela A. Rivellese, MD

2009



The high-carbohydrate/high-fiber diet reduced the postprandial incremental areas under the curve of triglyceride-rich lipoproteins, in particular, chylomicrons .

Diet rich in carbohydrate and fiber, essentially based on legumes, vegetables, fruits, and whole cereals, may be particularly useful for treating diabetic patients because of its multiple effects on different cardiovascular risk factors, including postprandial lipids abnormalities.



Garaulet Method

since 1993

Mediterranean

- Weekly distribution

Breakfast

Three groups of food

Main food

2 -3 day legumes

1-2 day pasta

1-2 day rice

***2 days vegetables as
main dish***

2 days meat or fish

Dinner

Rest to complete portions

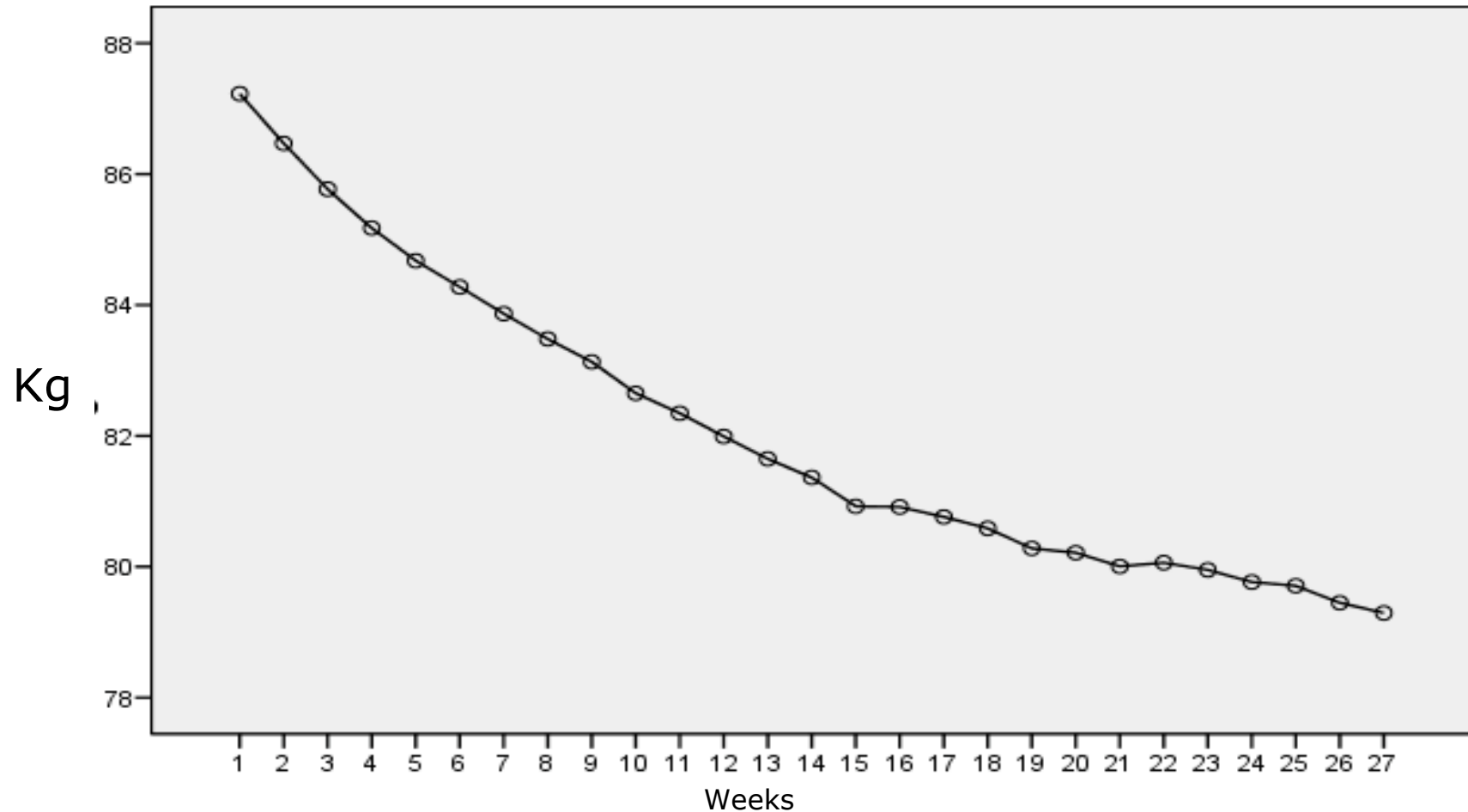
Olive oil as the unique fat

Vegetables free

Garaulet et al., Nutr Hosp; 2009

Weekly weight loss

N= 1450



10% initial weight (9 kg) 650g per week

✓ Garaulet M et al., Journal of Human Nutrition and Dietetics, 1999,

✓ Corbalán-Tutau MD, Morales EM, Baraza JC, Canteras M, Garaulet M, Nutrition, 2009,

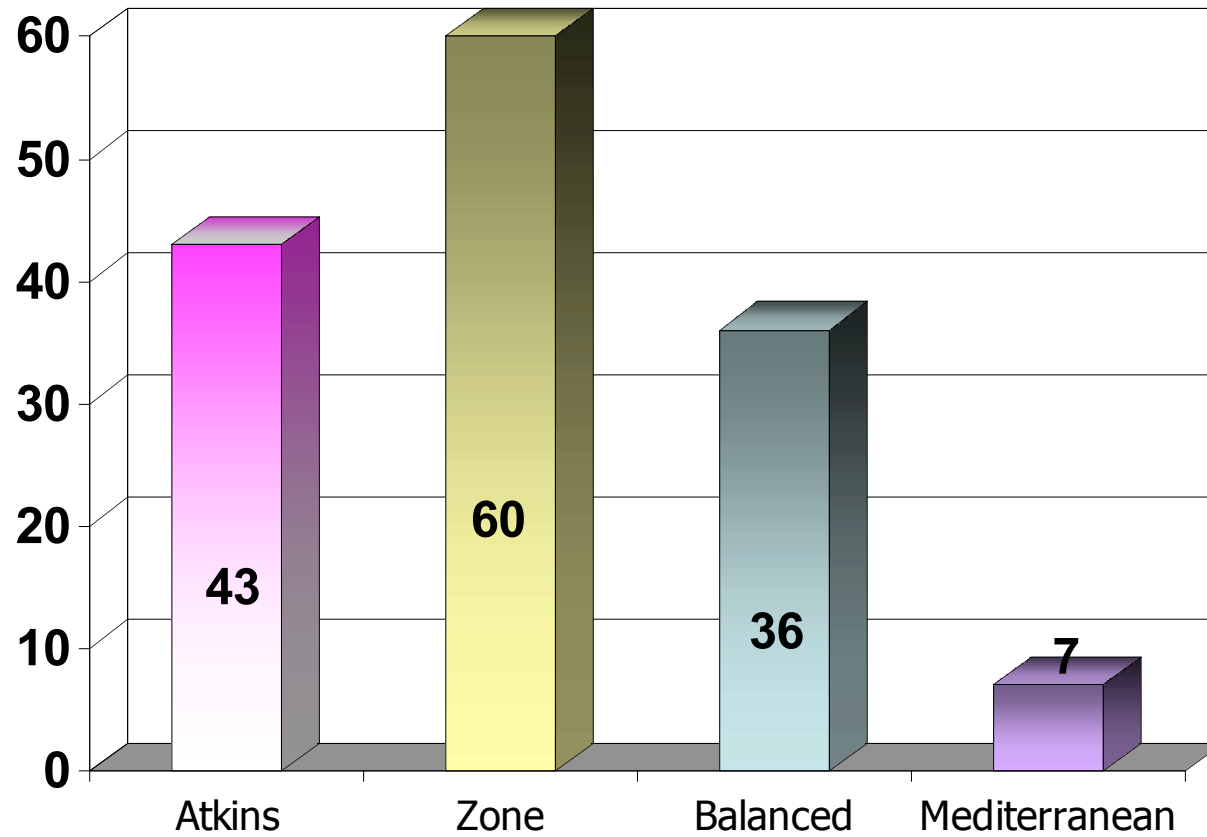
Changes in Patient's dietary intake with treatment

Intake	Initial	During treatment	<i>P</i>
Total Energy (kcal/day)	2016.3 ± 667.1	1350.8 ± 265.2	0.0001
Proteins (%)*	16.5 ± 3.7	18.8 ± 2.3	0.0001
(g/day)	82.6 ± 30.6	63.0 ± 11.6	0.0001
Carbohydrates (%)*	39.6 ± 9.4	47.4 ± 5.6	0.0001
g/day	198.1 ± 78.9	159.5 ± 33.8	0.0001
Fats (%)*	43.8 ± 8.2	33.8 ± 5.4	0.0001
g/day	99.2 ± 40.3	51.2 ± 14.8	0.0001
Fiber (g/day)	18.6 ± 10.2	22.07 ± 6.4	0.0001

Data are expressed as means ± SD, $P < 0.001$ considered significant. * Derived from total Energy Intake.

During treatment 89% of the subjects achieved all the Mediterranean recommendations, while 11% did not attain the diet recommendations

Attrition (%)



Corbalán-Tutau, et al (from Garaulet) 2009, Nutrition

The good results in adherence

- **Mediterranean style diet approach**

- Subjects find this diet tastier than the low-fat regimens tried before.
- Olive oil enhances the flavor of certain foods and may contribute to increase vegetable intake.
- Pasta is also related to a higher intake of vegetables
- increase of legumes such as lentils, beans and chick peas, improved the fiber intake, which increased satiety contributing to control of calorie intake

- Inclusion of elements from **behavioral therapy**

Madrid

Dietary records

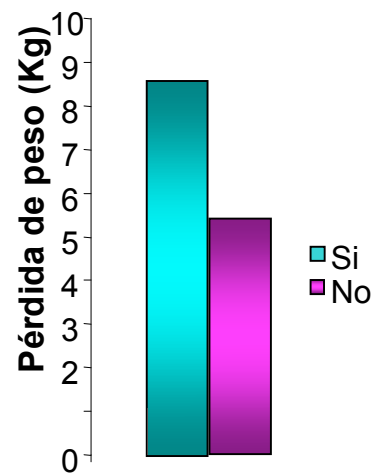


By means of this daily log, the patient may, for example, learn at what times they eat, that they eat when stressed, depressed, bored, in the company of certain people.

Day Monday 23 January					
Hour	Food and drink consumed	Place		Portions Optional calories	Comments
9:00AM	1 glass milk + sugar 1 toast with ham 1 orange juice	Bar	*	1Ma, 1B, 1P, 2F, 20 kcal	Toast weighed approx. 60g, though I did not weigh it.
3:00 PM	1 salad + oil 1 plateful lentils + rice 1 cup fruit salad	Home (dining-room)	*	2V, 1B, 1P, 1Fat, 2F	I did it great, I felt satisfied.
	1 portion chocolate	Home (bedroom)		150 kcal	I was bored reading in my bedroom
	Sandwich cheese + ham 1 low-fat yoghurt + cookies 1 banana	Home		1B, 2P, 1M, 1F	I felt completely satisfied
7:00 PM					
10.00 PM					

*Garaulet M. Pierde peso sin perder la cabeza. Madrid. Ed. Editec. 2004. (In Spanish)

80-90%
Group assistance



Group Therapy



✓ Garaulet M et al., Journal of Human Nutrition and Dietetics, 1999, II= 1,14



Corbalán-Tutau MD, Morales EM, Baraza JC, Canteras M, Garaulet M, Nutrition, 2009, II=2,28

Attrition

1999 Jeffrey et al (1)	1999 Garaulet <i>(J Hum Nutr)</i>	2008 Garaulet <i>(Nutrition)</i>
80%	59%	4-9%



• Conclusions

- Macronutrient composition may be not important in total weight loss (kg)
- Inter-individual variability

However:

- High-fat diets have harmful effects
- Specific hungers (for CH)
- High attrition

Mediterranean diet +behavioral techniques has been demonstrated to be a good alternative for obesity treatment